

Ταυτοτητες

$$1. (a+b)^2 = a^2 + 2ab + b^2$$

$$2. (a-b)^2 = a^2 - 2ab + b^2$$

$$3. (a-b)(a+b) = a^2 - b^2$$

$$4. (a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$5. (a-b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$6. a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$7. a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

Αλγεβρικά παραδείγματα

$$1. \underline{(2x-1)^2 - (2x-2)(2x+2) =}$$

$$= (2x)^2 - 2 \cdot 2x \cdot 1 + 1^2 - ((2x)^2 - 2^2)$$

$$= 4x^2 - 4x + 1 - (4x^2 - 4)$$

$$= \cancel{4x^2} - 4x + 1 - \cancel{4x^2} + 4$$

$$= -4x + 5,$$

Προβόχч

$$1. (2-3x)^2 = 2^2 - 2 \cdot 2 \cdot 3x + (3x)^2$$

$$2. (-x-1)(x-1) = 1^2 - x^2$$

οποιοσ έχη το ίδιο πρόσημο
πάει πάντα πρώτος.

$$3. (-x+2)(x+2) =$$

$$= -x^2 + 2x + 2x - 4$$

$$= -x^2 + 4x - 4$$

$$4. (-x+1)^2 = (1-x)^2 = 1 - 2x + x^2$$

$$(-x-1)^2 = (x+1)^2 = x^2 + 2x + 1$$

$$(-x+1)^3 = (1-x)^3 = \dots$$

$$(-x-1)^3 = -(x+1)^3 = -(\dots)$$

Δυναμεις

1. $a^v = \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_{v \text{ φορές}}$

n.x

$$2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$$

και οχι $2^4 = 8$

$v \rightarrow \text{εκθετική}$

2. $a \rightarrow \text{Βασική}$

3. Βασικές δυναμεις

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$7^2 = 49$$

$$2^4 = 16$$

$$3^4 = 81$$

$$8^2 = 64$$

$$2^5 = 32$$

$$2^6 = 64$$

$$9^2 = 81$$

$$10^2 = 100$$

4.

$$a^0 = 1$$

$$a^1 = a$$

$$1^v = 1$$

$$0^v = 0$$

$$10^v = 1 \underbrace{0000 \dots 0}_v \text{ μηδενικά}$$

$$10^{-v} = 0, \underbrace{000 \dots 0}_v 1$$

v δεκαδικά ψηφία,

5.

$$a^{-v} = \frac{1}{a^v}$$

$$\left(\frac{a}{b}\right)^{-v} = \left(\frac{b}{a}\right)^v$$

6.

$$a^v \cdot a^p = a^{v+p}$$

$$a^v : a^p = a^{v-p}$$

$$\frac{a^v}{a^p} = a^{v-p}$$



εχον

ιδιω

Βαση,

7.

$$\left. \begin{aligned} a^v \cdot b^v &= (a \cdot b)^v \\ a^v : b^v &= (a : b)^v \\ \frac{a^v}{b^v} &= \left(\frac{a}{b} \right)^v \end{aligned} \right\} \begin{array}{l} \text{ιδω} \\ \text{εκθω} \end{array}$$

8

$$(a^v)^{\mu} = a^{v \cdot \mu}$$

9.

$$(-a)^v = a^v \quad \begin{array}{l} \text{εφωδω} \\ \text{v αρτω} \end{array}$$

Βασικη Ασκησι

Δυναμεισ

$$1. \left[(x^2)^3 : x^{-2} \right]^2 = (x^6 : x^{-2})^2 = \\ = (x^8)^2 = x^{16}$$

$$2. \frac{(-16)^4}{8^4} : \left(\frac{1}{2^{-2}} \right)^3 =$$

$$= \left(\frac{-16}{8} \right)^4 : \left(\frac{1}{2^{-2}} \right)^3$$

$$= (-2)^4 : \frac{1^3}{(2^{-2})^3} =$$

$$= 2^4 : \frac{1}{2^{-6}} = 2^4 \cdot \frac{2^{-6}}{1} =$$

$$= 2^4 \cdot 2^{-6} = 2^{-2} = \frac{1}{2^2} = \frac{1}{4}.$$

$$3. \frac{[(x^2)^3 \cdot y]^{-2}}{(xy^2)^{-1} \cdot x^3 \cdot (y^2)^{-2}} =$$

$$= \frac{(x^6 y)^{-2} : xy}{x^{-1} y^{-2} \cdot x^3 y^{-4}} =$$

$$= \frac{(x^{-12} y^{-2}) : xy}{x^2 y^{-6}} = \frac{x^{-13} y^{-3}}{x^2 y^{-6}}$$

$$= x^{-15} y^3$$

Ο Σηχος Παραγοντοποιησης

1.

Οταν εχω δυο ορους
τοτε ακολουθω τα
παρακατω Βηματα.

$$\rightarrow 2x^2 - 4x = 2x(x - 2)$$

$$\rightarrow 4x^2 - 1 = (2x)^2 - 1^2 = (2x - 1)(2x + 1)$$

$$\rightarrow x^3 + 8 = x^3 + 2^3 = (x + 2)(x^2 - 2x + 2)$$

$$\begin{aligned} \rightarrow 8x^3 - 1 &= (2x)^3 - 1^3 = \\ &= (2x - 1)(4x^2 + 2x + 1) \end{aligned}$$

2.

Οταν $\epsilon x w$ $\tau p a l$
οπου S .

$$\rightarrow 2x^2 - 4x + 8x^3 = 2x(x - 2 + 4x^2)$$

$$\rightarrow 4x^2 - 4x + 1 = (2x - 1)^2$$

$$\rightarrow 2x^2 - 5x + 2 = 2(x - 2)(x - \frac{1}{2})$$

$$\left. \begin{array}{l} \alpha = 2 \\ B = -5 \\ \gamma = 2 \end{array} \right\} \begin{array}{l} \Delta = B^2 - 4\alpha\gamma \\ \Delta = (-5)^2 - 4 \cdot 2 \cdot 2 \end{array}$$

$$\Delta = 25 - 16$$

$$\Delta = 9$$

$$x_{1,2} = \frac{-B \pm \sqrt{\Delta}}{2\alpha} = \frac{-(-5) \pm 3}{4} = \frac{5 \pm 3}{4} \begin{cases} 2 \\ \frac{1}{2} \end{cases}$$

3.

Οταν έχω τωσες ορες.

$$\rightarrow x^3 - x^2 - x + x^4 = x(x^2 - x - 1 + x^3)$$

$$\rightarrow \underbrace{x^3 - x^2}_{x^2(x-1)} - \underbrace{x + 1}_{-(x-1)} =$$

$$= x^2(x-1) - (x-1) =$$

$$= (x-1)(x^2 - 1) = (x-1)(x-1)(x+1) = (x-1)^2(x+1),$$

$$\rightarrow x^3 - 3x^2 + 3x - 1 = (x-1)^3$$

Ασκηση

Να απλοποιηθεί η παράσταση

$$A = \frac{x^2 - 4x}{x^2 - 16} : \frac{x^3 - 2x^2 + x}{x^2 - 4x + 3}$$

$$A = \frac{x(x-4)}{x^2 - 4^2} : \frac{x(x^2 - 2x + 1)}{(x-3)(x-1)}$$

$$A = \frac{\cancel{x}(\cancel{x-4})}{(\cancel{x-4})(x+4)} : \frac{x(x-1)}{(x-3)(\cancel{x-1})}$$

$$A = \frac{\cancel{x}}{x+4} \cdot \frac{x-3}{\cancel{x}} = \frac{x-3}{x+4}$$

$$x^2 - 4x + 3 = (x-3)(x-1)$$

$$\boxed{a=1 \quad b=-4 \quad \gamma=3}$$

$$\Delta = b^2 - 4a\gamma = 16 - 12 = 4$$

$$x_{1,2} = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm 2}{2} \begin{matrix} \textcircled{3} \\ \textcircled{1} \end{matrix}$$

Επόμενο μάθημα

Ημερομηνία μαθήματος: 11/9/26

Ώρα μαθήματος: 18:30

Ασκήσεις

Αλγεβρικό

παραστατικό

Pdf.

παρατηρήσεις

Ασκηση δία ελίτε

1. Να γίνω οι παρακάτω.

$$\textcircled{\alpha} (x-2)^2 - (x+2)^2$$

$$\textcircled{\beta} (x+1)^2 - (2x-3)(2x+3)$$

$$\textcircled{\gamma} (2x+1)^2 - (3x-2)(1-x)$$

$$\textcircled{\delta} (2x-3)^2 + (x+2)^2 - (-x+1)(-x-1)$$

$$\textcircled{\epsilon} (2x-3)(x-4) - (1-2x)(-1-2x).$$